Space Weather Forecast

Issued on Wednesday, 06 April 2022 at 13:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/G2 Minor to Moderate Geomagnetic Storms likely day 1 and early day 2 (6th and 7th) due to CME arrival.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with only a few common class flares, the strongest of which occurred from a sunspot group that has rotated away from the Earth-side of the Sun. There are currently six sunspots on the visible disc with the largest gradually showing signs of decay, along with another sunspot region to the south of it. All other regions are small and simple. No Earth-directed coronal mass ejections (CMEs) have occurred in the last 24 hours, although there are a number of filaments (lines of material held together on the Sun by its magnetic field) visible on the Earth-facing disc that are being monitored for any potential lift.

Solar Wind / Geomagnetic Activity: The solar wind has been slightly elevated, with speeds easing to 400km/s. The magnetic field carried by the wind was mostly weak, with its north-south component also weak. However this did spend much the period in a negative (southward) direction. Geomagnetic activity was Quiet to Unsettled (Kp1-3).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms occurring.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Very Low, with relatively fewer and less complex active regions on the visible side of the sun than of late.

Solar Wind / Geomagnetic Activity: A CME which left the Sun due to a filament lifting off on the 3rd is expected to arrive at Earth in the coming 12 hours. This will bring a slightly elevated solar wind environment around Earth, easing day 2 (7th). Otherwise mainly background solar winds are expected until day 4 (9th), with the arrival of the faster winds from a coronal hole. There is also the low chance of another glancing interaction from a further CME although this is very low confidence. This one left the Sun late on the 4th. Geomagnetic activity is forecast to become Active to G2/Moderate Storm from the CME arrival later on day 1 (6th) and likely persisting into the first half of day 2 (7th). Quiet, isolated Unsettled conditions then returning, before a further enhancement to Active to G1/Minor Storm is likely day 4 (9th) from the arrival of the CH fast winds. With Minor to Moderate geomagnetic storming forecast, aurora will potentially be visible across parts of Scotland (most likely the north) and similar latitudes overnight on the 6th into the 7th.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to remain at background with no solar radiation storms occurring.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	70	60	1	40
Strong	G3	No	5	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	10	10	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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